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BY

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SOME CHECK IN AND OUT SYSTEMS FOR COAL MINES[1]

By R. D. Currie[2]

Many coal companies have a system for checking men into and out of the mine, and generally such systems appear to be perfectly sound and adequate. However, when the real test comes at the time of a mine disaster, too often the system is found to have failed, and hours and sometimes days pass before it is known how many men are in the mine and who they are.

Most of the systems in use, when properly maintained, are adequate for the routine work of the mine, and some of them may prove adequate at the time of a mine disaster. All systems, however, depend upon proper supervision and strict adherence to the system.

Notable Failures of Some Systems

In the past few years there have been a number of outstanding examples of failure of the check in and out system at the time of a mine explosion in West Virginia, Pennsylvania, Alabama, Utah, Colorado, and other States.

Systems in Common Use

There are a number of systems in use. Some are very good, and others so poor as to be almost valueless. It is believed that a combination of two systems is superior to depending on any one alone. Some of the systems in more or less common use follow.

Punch-Clock System

The punch-clock or time clock system, which has been in use in many large factories and industrial concerns for years, has been adopted by some Pennsylvania mines and is claimed to be very reliable. At one mine the "clock" is located in the lamp house and consists of a recording clock with dials on which numbers from 1 to 99, 100 to 199, etc., are arranged. After the miner receives his lamp and is ready to leave the lamp house he approaches the dials and turns a lever to his check number, at which point he pushes the handle which rings a bell and records his number and the exact time of punching on a paper roll. When the miner comes out of the mine this process is repeated. This system preserves a record which shows the time each employee entered or left the mine and also shows which employees are in the mine at any given time, thereby providing an accurate check on all persons whose duties take them underground. However, there are almost invariably certain employees whose duties cause them to enter and leave the mine several times during the working shift, and usually they do not punch the clock, at least in connection with some of these comings and goings. Hence, in case of a disaster there may be confusion as to the whereabouts of some of these employees.

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Time-Keeper System

The time-keeper system consists of making a written record of each man who gets an electric cap lamp. The time keeper's window is located adjacent to the lamp room, and the men give their numbers to the time keeper as they line up to receive their lamps. This process is repeated in the evening when the lamps are returned. In this way a written record is kept of the men going into and out of the mine, and from this record may be determined at any time which employees are in the mine. This system is subject to the same limitations as the punch-clock system in connection with employees whose duties require them to enter and leave the mine several times during the shift.

Lamp-Check System

The lamp-check system is in common use in many coal mines where closed lights or electric cap lamps are used. In this system the miner exchanges a numbered check for a lamp. After the lamps have been distributed the lamp man or an assistant places the numbered checks on a numbered board. The check board has consecutively numbered hooks; the checks are hung on the hooks corresponding to the check numbers. After the miner returns his lamp in the evening he goes to this board and removes his check. The checks on the board at any time show who is in the mine at that time.

Double-Check System

The double check in and out system used by one large coal company consists of a check board with hooks on which checks are hung. The size of the board varies with the number of checks to be used, as follows:

No. of checks	Dimensions of board		No. of checks per row	No. of rows
	Width	Height		
50	3' 3½"	2' 5¼"	10	5
100	4' 7¾"	2' 10¾"	15	7
150	4' 7¼"	3' 7"	15	10
200	6' 0"	3' 7"	20	10
250	6' 0"	4' 3¼"	20	13
300	7' 4¼"	4' 0½"	25	12
350	7' 4¼"	4' 6"	25	14

For more than 350 checks two boards are used.

Two checks are used, one a brass check and the other an aluminum check, each having the same number stamped on it. When about to enter the mine the employee hangs the aluminum check on the proper hook, and the brass check is carried in the employee's pocket. Upon leaving the mine the aluminum check is removed from the board and the brass check hung on the hook, above which is 2 3/4 inch by 7/8 inch card fastened in a metal clip. This card shows the check number, name, address, and working place of the man using that number. The face of the card is protected by a slip of transparent celluloid. This system is in use in addition to the lamp-check system. A penalty is imposed on any man who fails to check in or check out of the mine.

This system shows at a glance the number of men in the mine, where they are working, who they are, and where they live.

Modified Check-Board System

At a shaft mine a check-board system is in use, which varies from the foregoing in that each man as he is about to enter the cage at the surface is required to furnish the top man or cager with a brass check on which his payroll number is stamped. In addition to this, he is required to show the top man or cager an aluminum check (for identification) with the same number stamped on it. The brass checks are hung on a board at the shaft head by the cager after all the men are in the mine. On leaving the mine the men take their own checks from this board. By looking at this board it can be determined at any time just who is in the mine.

Check-Board System

A system at a drift mine uses a numbered check board on which each man entering the mine hangs a brass check containing his payroll number. In the evening the miner removes his check from the board. This board shows at any time which men are in the mine.

Precautions to be observed in checking systems

These descriptions in general cover the systems in common use, and it is believed that any one of them when properly maintained and with proper precautions will prove adequate. There are a number of safeguards that must be provided with each system, however, and it is believed that many necessary precautions frequently are overlooked.

In the punch-clock system the men must be properly instructed in the use of the clock, and it is imperative that each man punch the clock at the proper number. To insure that these precautions are taken it is advisable that a watchman be stationed in the clock room to observe each man punching the clock. A chart showing the men's names and numbers should be hung in the clock room.

The clock room should be fairly close to the shaft and so arranged that the men must pass through it to get to the shaft, but far enough removed so that it will be undisturbed in case of a mine disaster. This system does not provide for a life check to be carried by each person underground, and it is of utmost importance that each and every person who goes underground in any coal mine have on his person a numbered check or similar record for identification in case of disaster.

The precautions to be taken in the time-keeper system to assure its accuracy are somewhat similar to those in the foregoing system. In the first place the time keeper must be accurate in recording the check numbers of the men. A chart showing the men's numbers and names should be available in the time keeper's office, and the office should be so arranged that the men must pass it to get to the mine opening, but it should be far enough removed that it will be undisturbed in case of a mine disaster.

The precautions to be taken in the lamp-check system, which is probably the most commonly used system are:

a. The lamp check must correspond with the payroll number.
b. Care must be taken to see that the checks are properly placed on the board immediately after they are received.
c. Prompt removal of the checks from the board by the men leaving the mine must be enforced.
d. The board must be so placed that it will be protected from winds which are liable to blow the checks off the board, and it must be far enough removed from the mine opening that it would be undisturbed in case of a mine disaster.

The precautions to be taken in the double-check, modified check-board, and the check-board systems are the same as for the foregoing or for the lamp-check system.

Combination of Systems

It is believed that a combination of two of these general systems is better than any one alone. For this purpose it is believed that the punch-clock system or the time-keeper system, combined with the lamp-check system or check-board system, is the ideal combination which should be used at all coal mines.

Need of adequate checking system

There are many mines, particularly open-light mines, having widely scattered openings where men enter and leave the mine, that have no check in and out system. At such mines and under such conditions no knowledge of the number of men in the mine is had until the section foreman has made his rounds. A man may be trapped in the mine in the evening and unless reported missing by his family no one would know of it until the following day. This situation arises far too frequently. Such a condition should not be permitted, and every effort should be made to establish an accurate and reliable check in and out system at every mine to safeguard both employer and employee.

It is advisable to have an identification system in conjunction with the check in and out system. This can be accomplished by having each man carry a life check on his person. This check should be numbered to correspond with check number used for checking in and out. This identification check can also be used to identify a man at the supply store and wherever identification is necessary on company property. Some of the systems in use provide for this; others do not.

The site for the check board or checking device should be selected with care. There are a number of cases on record of check boards being destroyed by the explosion that wrecks the mine. A notable example is found in an explosion at a mine in the west. The explosion destroyed the check board, and no record was at hand to indicate the number of persons in the mine. As a large number of lives were lost there was considerable uncertainty for several days as to whether all bodies had been recovered.

The health and comfort of employees should be borne in mind when the checking system is being planned. The check board or checking device should be in a building capable of accommodating all men who may have to form in line and wait to receive or to return their checks or lamps. If men must wait in the wet or cold, especially after coming out of the mine, their health may be impaired.

The value of a checking system is fully appreciated under actual working conditions if blasting is done on the surface after all men have left the mine or if blasting is done by shot-firers after all other persons have left the mine. Many accidents have occurred as a result of blasting, and if blasting is done by shot firers the shift of men should have left the mine. An effective checking system quickly gives information concerning how many persons are in a mine at any time. However, it is important to require all persons going underground to carry a life check; and any person whose duties require him to enter and leave the mine frequently during a shift should report to some responsible person or be required to remove his check upon coming out of the mine and replace the check upon reentering.

It is believed that if a penalty of 50¢ or $1.00 were imposed for each failure to comply with rules as to checking the system would operate effectively. Such fines may be used in connection with a welfare fund or for entertainment, or some similar purpose.

There is a definite need for a checking system at every coal mine, and it is urged that all mines not using a system of checking employees and others into and out of the mine give careful consideration to an effective installation that will at all times show what persons are underground and if at all feasible also show essentially where they should be in the mine if in their usual place of work.